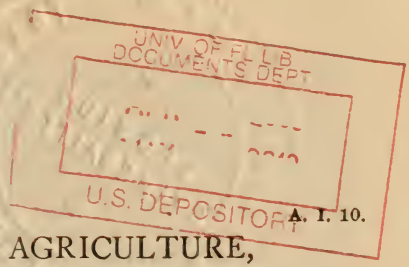

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U. S. DEPARTMENT OF AGRICULTURE,

STATES RELATIONS SERVICE,

A. C. TRUE, Director.

INSTRUCTION IN SHEEP AND GOAT HUSBANDRY.

SUGGESTIONS FOR TEACHERS IN SECONDARY SCHOOLS.

By H. P. Barrows, *Specialist in Agricultural Education.*[1]

INTRODUCTION.

In teaching animal husbandry, as in every other phase of agriculture, there is a great need of adapting the course of study in a better way to the interests of the students and the needs of the particular community in which they live and in which the school is located. In a dairy section where the students are engaged in caring for cows their daily experience in feeding the animals and in caring for the milk should form a basis for the major part of the classroom discussion of principles. If the student is taking care of animals on his own account as a home project, there will be no lack of interest in the classroom work if it is based upon the real problems which the students are meeting. Poultry and pigs are becoming important features of the secondary course in animal husbandry because they afford at this time a ready means of increasing our meat supply and because they furnish suitable home projects. At this time teachers in many sections of the United States may very well consider the possibilities in raising sheep and goats in the section in which the school is located and the opportunities afforded for home projects for students who have favorable conditions. Although sheep or goats may not be important in the community, and comparatively little time taken for the class as a whole in their consideration, aid and guidance should be given to those students who desire to make an individual study of the industry in connection with their home projects or regular work on the farm.

I. SHEEP.

SCHOOL AND HOME PRACTICUMS.

As far as possible the work of the classroom should be connected very closely with the practical work of the farm. As a rule, it will be better to approach the principles in an inductive way through concrete experience and practice. It will not always be possible, however, to have the practicums precede the recitation.

The following exercises may be undertaken by the class as a whole at the school or upon neighboring farms or may be assigned as individual home

[1] Prepared under the direction of F. E. Heald, Specialist in Agricultural Education, in charge.

41607°—18

practicums. Credit should be given for the work done at home when the student has demonstrated his proficiency.

Handling sheep.[1]—As a preliminary to work in judging and general management of sheep, students should have practice in catching and moving sheep and in proper methods of handling, including the setting of a sheep upon its rump.

Use of score card.[1]—As preparation also for work in judging, students should become familiar with the points of the animal and classification and weight given those points on a score card. It is well to begin with a study of the type most important in the district. In most sections the mutton type will receive first consideration. Later, in connection with a study of breeds, there may be time for a consideration of score cards for one or more of the breeds important in the district. As a rule, score cards may be obtained from the State college of agriculture.

Estimating age and weight of sheep.[1]—In connection with the use of the score card, students should be given practice in estimating the age of sheep by the teeth and condition of the mouth. The score card will also call for an estimate of the weight of the animal. If possible, scales should be used as a check upon the estimates of the students.

Grading wool.[1]—In order to develop an appreciation of greater care in selecting and handling sheep with regard to developing and maintaining a better standard of wool, some attention should be given to a study of market grades and classes and to practical work in judging wool. Department Bulletin 206, The Wool Grower and the Wool Trade, gives illustrations and descriptions of market grades and classes which may be made a basis for such a study.

Comparative judging.[1]—The exercises suggested should be considered, but preliminary to real judging; i. e., judging by comparison. Abundant practice should be given in placing two or more sheep according to their merit with regard to different factors such as quality, constitution and market condition, and with regard to their general value. Practice should be given also in selecting sheep for breeding or feeding purposes from a flock and placing value on sheep selected for a definite purpose.

Making equipment.—Inasmuch as sheep require a good deal of equipment which may be made on the farm, there is an excellent opportunity for the class which is considering sheep husbandry to cooperate with a class in farm mechanics in the practical woodworking exercises involved. Directions for the following exercises may be obtained from Farmers' Bulletin 810, Equipment for Farm Sheep Raising:

(1) Plans of sheep barns and sheds.—Although there may be no opportunity for the majority of schools to undertake the construction of a sheep barn as a class project, wherever sheep husbandry is important students should be required to adapt the plans given in Farmers' Bulletin 810 to meet the needs of their home farms.

(2) Making feed racks and troughs.—From the variety of racks and troughs described in the bulletin a selection may be made of those fitting local needs and conditions. Such equipment may be made for a near-by farm as a class practicum or assigned to a student as an individual home practicum or to be made in connection with his project in raising sheep.

(3) Lambing pens, creeps, fences, and hurdles.—Plans of a variety of fence panels with suggestions for making lambing and claiming pens, creeps, hurdles, and dog-proof fences are also given in the bulletin from which suitable equipment may be selected to meet the needs of class members or school patrons. The making of such equipment may also be suitable for the class as a whole or for individual students.

(4) A dipping vat.—Some of the agricultural schools in the South have rendered a good service to the community and at the same time given good practice to their students by having them construct and operate a community dipping vat at the school. Although such a project may not be needed or feasible in all sections where sheep husbandry is carried on, in most sections it will be possible to let the students have some participation in the dipping and hand dressing of sheep for scab, lice, and ticks. Plans and specifications

[1] Suggestions with regard to handling sheep, use of the score card, estimating the age of sheep, grading wool, and comparative judging will be found in Department Bulletin 593, Judging Sheep as a Subject of Instruction in Secondary Schools.

for dipping vats and directions for dipping may be obtained from Farmers' Bulletin 713, Sheep Scab.

Docking and castration.—Although the secondary school may not attempt any technical training in veterinary practice, it should give practical instruction in preventing disease and in the minor operations ordinarily performed on the farm. The instructor who has had training in this work will not hesitate to demonstrate to his students proper methods of docking and castrating lambs and then give them an opportunity to do the work by themselves under his direction. Directions for both operations are given in Farmers' Bulletin 840, Farm Sheep Raising for Beginners.

Trimming and shearing.—If the instructor has not had training in trimming or shearing it may be possible to secure the services of an expert to demonstrate proper methods to the students and get them started along the right lines in practical work. The work in trimming should be done in connection with a consideration of fitting the sheep for the show ring which may be considered in connection with practice in judging. Practice in shearing is most important for the majority of students. It will not be possible in the time available to develop speed and expert skill, but it should be possible to show the students how to do it properly and encourage them to develop skill as opportunity is afforded.

THE HOME PROJECT.

Mutton and wool production.—The present high prices of both wool and mutton with the passing of a large part of the sheep industry from the ranges of the West are creating a new interest in sheep husbandry on the farm. As success with sheep depends to a great extent upon learning their habits and needs in an intimate way, it is well for future shepherds to get an early start. It is comparatively easy to get a start with sheep, hence a beginning in practical sheep husbandry makes an excellent home project for students in favorable sections. Such a project should afford a good basis for much of a general course in animal husbandry.

As a beginning project in most cases it will be best for the student to undertake the care of a number of ewes for the production of lambs for the market or the fattening of feeders with the production of mutton as the primary aim. The production of wool and the selection of ewes as breeders may be incidental to the main project. If this work is to constitute a major project, there should be at least 6 ewes, if the start is made with ewes, or 10 lambs or feeders if it is merely a feeding proposition. The experience growing out of such a project will enable the student to determine whether he desires to go into sheep husbandry and will give him some experience useful in developing a breeding flock. If the student is on a farm where sheep are raised, it may be possible for him to take over the care of the farm flock or to have some of the sheep to feed and manage upon his own account.

Developing a breeding flock.—The aim of the instructor in getting a student to take hold of sheep on a farm suited to sheep husbandry should be to have him develop a flock as a permanent proposition. Although he may work into the business gradually, it should be with high ideals and with an idea of increasing the flock toward the maximum capacity of the farm as fast as his training and time will permit. The student may start with grade ewes, but if the work of the school is effective he will not be satisfied unless he is working toward pure-bred stock. Although producing animals for breeding purposes calls for a high degree of intelligence and adaptability to the work at hand, it is just this sort of farming for which our students should be prepared.

The following outline is suggested for a project in which the primary aim is mutton and wool production, but in which the supposition is made that the student will work toward developing a breeding flock.

SHEEP PROJECT STUDY OUTLINE.

I. What are the present prospects for profitable sheep husbandry in this section?
   1. Is this section suited especially to sheep raising?
   2. May I use any of our farm for sheep which is not now profitable?
   3. What are the local market demands?

4. What are the facilities for shipping?
5. How do the prices paid for mutton and wool compare with the prices of hay and grain?
6. Can an abundance of cheap forage be raised?
7. Have disease and pests proven serious?
8. What trouble may be expected with dogs?
9. May good stock be secured at a reasonable price?
10. What returns may be expected from sheep in this section?
11. What are the advantages claimed for sheep husbandry in connection with general farm management?
12. Do I like sheep and have a desire to become proficient in their management?

II. How shall I get a start with sheep?
1. What shall be my aim in raising sheep?
2. What is the best season for making a start?
3. What is the advantage in starting with grade ewes?
4. Why is it advisable for the farmers of a community to raise the same breed?
5. Why should only pure-bred rams be used in the community?
6. What is the best age at which to purchase breeding ewes?
7. What advantage is there in securing ewes that have lambed once?
8. How can the age of the ewes be determined?
9. How many ewes shall I secure for a start?
10. Why is it best to start in a relatively small way?
11. Why is a larger flock more economical in an established business?

III. What breed shall I select?
1. What breeds are best suited for the production of fine wool?
2. What breeds are best suited for the production of coarse wool?
3. What are the best mutton breeds?
4. How may the leading mutton breeds be distinguished?
5. What is the breed most popular in this section?
6. Is this breed well suited to the section and to my particular needs?
7. What are the chief characteristics of the breed I shall breed?
8. Can I select individuals representing the best breed type?

IV. Can I select good breeding animals?
1. What different qualities shall be considered in selecting sheep by the breeder and by the butcher?
2. Why is sex character important in breeding animals?
3. What are the main points showing sex character to be sought in breeding ewes?
4. What are the main points showing sex character to be sought in breeding rams?
5. In what sort of condition should the breeding animals be?
6. Where can I secure such animals as will fit my needs?
7. What price should such animals be worth?

V. What equipment will I need for raising sheep?
1. Can I remodel a part of existing barns or sheds that will be suitable for my sheep?
2. Can I plan an ideal barn or shed for this section?
3. What are the essential features to be provided in a building for sheep?
4. Can I make such feed racks and grain troughs as will be required for my sheep?
5. What equipment will be needed in taking proper care of the ewes at time of lambing?
6. What are "creeps" and how are they used?
7. What are the specifications of a good dog-proof fence?
8. How are hurdles used for sheep?
9. How can a good hurdle be made?
10. What device makes the best temporary sheep fence?
11. Will I need to build a dipping vat or may I have the use of a vat in the community?
12. What provision must I make for watering my sheep?
13. What hand tools will I need in caring for my sheep properly?

VI. Do I understand how to handle sheep?
1. Why is it especially important that sheep shall be handled gently and quietly?
2. What is the best way to catch a sheep?
3. How should sheep be led or moved from place to place?
4. How can a sheep be set upon its rump?
5. What is the best way to load a sheep into a wagon?
6. How is a crate made which will be suitable for shipping sheep?

VII. Can I give breeding sheep proper care?
1. At what age should ewes be bred?
2. What is the period of gestation in sheep?
3. At what time shall I breed my ewes?
4. How can the time for breeding be determined?
5. What is meant by "flushing" ewes?
6. Why should the ewes be gaining in weight at time of breeding?
7. What feeds are considered good for supplementing ordinary pasture at this time?
8. Under what conditions may a ram lamb be used for breeding?
9. What is the advantage in confining a breeding ram?
10. How should a ram be managed under such conditions?
11. What methods are used to determine when the ewes are bred?
12. Why should careful records be kept of the breeding?

VIII. Can I feed my sheep at all seasons for the best results?
1. How can the need for feed be determined by the condition of the sheep?
2. What feeds will serve best for breeding sheep in the fall?
3. How may sheep be used to advantage in cleaning up the farm at this time?
4. What sort of roughage is best for winter feeding?
5. Why is clover or alfalfa hay better than cornstalks or timothy for feeding sheep?
6. What sort of feeds should be used to supplement straw and cornstalks?
7. Why is some succulent feed necessary?
8. What precautions must be taken with such feeds as turnips and corn silage?
9. With the feeds I have available can I work out satisfactory rations for my breeding ewes?
10. What is the best pasture for sheep in this section?
11. What forage crops may be used as a satisfactory supplement to or supplement for summer pasture?
12. Why should forage crops be used for ewe lambs saved through the summer for breeding?

IX. What are the most important phases of general care to be given attention?
1. What form of protection must be given most consideration in winter?
2. Why is dampness more harmful to sheep than cold?
3. What provision should be made for exercise in winter?
4. What special care and attention should be given pregnant ewes?
5. What provisions do the State laws make with relation to sheep-killing dogs?
6. What precautions should be taken where dogs may prove a menace?
7. What provisions must be made for a supply of fresh water and salt?
8. How may bloating be avoided?
9 What may be done in a case of bloating?

X. Do I understand how to control parasites and prevent disease of sheep?
1. What is the cause of sheep scab?
2. What are the symptoms of this trouble?
3. How may real sheep scab be detected from other similar troubles?
4. Why is prompt control extremely important?
5. How is the disease transmitted?
6. Under what conditions is hand dressing justified?
7. What would be the most economical means of getting my sheep dipped if the disease should occur?

8. Do I understand the means and methods of dipping?
9. How should the premises be cleaned and disinfected to prevent its spread?
10. What is the nature of stomach worms?
11. Why is a knowledge of their life history important to the sheep man?
12. What are the symptoms of trouble caused by stomach worms?
13. What is the most efficient means of prevention and control of stomach worms?
14. What means may be taken to prevent foot rot?
15. Where may I secure definite information concerning sheep troubles?

XI. Can I manage my ewes properly at lambing time?

1. Why should close attention be given ewes at this time?
2. Why should heavy feeding be withheld from ewes just before lambing?
3. What are the indications that this time is approaching?
4. What are the advantages of individual lambing pens made of open panels?
5. What special precautions should be made in very cold weather?
6. How may the ewe be aided if lambing is abnormal?
7. What aid may be given weak lambs or lambs that may become chilled?
8. What may be done in case a ewe disowns a lamb?
9. What aid may be given a lamb in case of constipation or indigestion?
10. What treatment should be given for sore eyes and sore mouths?
11. What is the best time and the best method for docking lambs?
12. What is the best time and the best method for castrating the male lambs?
13. Why is it important to watch the condition of the ewes and take particular care in their feeding while the lambs are sucking?
14. How may the lambs be marked for identification?
15. Why should careful records be kept of lambs which may be used for breeding purposes?

XII. How shall I prepare the lambs for market?

1. Why is it most profitable to market the lambs early?
2. What special efforts should be made to keep the lambs growing from the start?
3. What are some of the best feeds to use in getting the lamb started to eat?
4. What special precautions should be taken to have the food clean and what may be done to increase its palatability?
5. What are the advantages in having lambs come after the ewes have gone on pasture and raising them on pasture alone?
6. What are the disadvantages of the plan?
7. What plan is followed to avoid stomach worms?
8. How are the lambs fed and managed when they alone are kept in the dry lot?
9. What are the advantages of keeping both ewes and lambs in the dry lot?
10. What crops are best suited to soiling in the dry lot?
11. How are the sheep managed under this system?
12. Under what conditions is the forage crop method popular in fattening lambs?
13. What forage crops and what method of rotation and management of such crop would be best suited to the section?

XIII. How shall I market my lambs and wool?

1. Why should the lambs be marketed as early as possible?
2. At what age will the lambs be marketed to good advantage?
3. How may I best keep in touch with market conditions?
4. Do I understand the important market classes and grades of sheep?
5. Is there an opportunity to secure full value on the local market?
6. May I cooperate with others in shipping to a distant market?

7. Do I understand the important market classes and grades of wool?
8. Will it pay as a rule to sell the wool at shearing time or hold for higher prices?

CLASSROOM INSTRUCTION.

Use of reference material.—Although most of the general textbooks on animal husbandry deal with sheep, none of them treat the subject as extensively as may be desirable in a section especially favored for sheep. While the special books on sheep are best suited to such special courses as are given in colleges, one or more of these books should be included in the high-school library to be used for reference purposes. The publications of the Department of Agriculture listed at the end of this document will serve well for the class and for special assignments to individual students. A number of the State colleges have issued excellent expository bulletins on sheep, which should be used in adapting the instruction to meet local conditions.

Although the project study outline given on the preceding pages is intended primarily to guide the student who has a project in making an individual study of the subject, it should be suggestive of a general consideration of the subject in the classroom. For a comprehensive reference for the subject, one that may serve as a text, Department Bulletin 20, The Management of Sheep on the Farm, is recommended. Farmers' Bulletin 840, Farm Sheep Raising for Beginners, will also serve well for the same purpose if supplemented with the following Farmers' Bulletins: 652, The Sheep-Killing Dog; 713, Sheep Scab, and 810, Equipment for Farm Sheep Raising.

Use of illustrative material.—The work of the classroom will lack vitality if it is not connected very closely with the practical work of the students and with the sheep industry of the community. The instructor with the aid of the students should make a survey of the district with regard to its sheep interests as a means of knowing the practices common in the section and of locating material to be used in teaching. Field trips should be planned for the purpose of bringing the students into close touch with the methods of the best farmers as well as to give them practice suggested previously. Inasmuch as the very best stock is often sent to the fairs, the teacher should seek opportunity to visit them with his students for the definite purpose of seeing good stock and getting in closer touch with the best breeders and judges and learning something of their methods. In connection with a study of market demands and methods of shipment visits should also be made to packing houses and shipping points, if such are convenient. If this department or the State college has established demonstration sheep farms near the school, it should be used by the class.

Although all schools will not be favorably situated with regard to good sheep farms and fairs, all teachers will be able to secure good illustrations to aid in visualizing the lessons given. Illustrations from the best papers and catalogues should be supplemented with charts and blackboard illustrations showing the conformation of types and naming of parts of animals in connection with judging, and plans of buildings, pens, and other equipment in connection with management. Along with a study of wool, samples from the various types of sheep taken from different parts of the body should be collected to be a part of the permanent school exhibit. It may be possible to secure from manufacturers samples showing market grades and classes of wool, and the steps represented in its manufacture into yarn and cloth.

II. GOATS.

POSSIBILITIES IN GOATS.

The present shortage of milk and the national movement to utilize all the land possible for food production is bringing the attention of thoughtful people to the possibilities in milk goats. Thousands of acres of vacant lots in and near our American cities and great tracts of unused land in the country might support goats which would in many cases supply a need for milk which at this time is acute among the poorer classes. A good goat will furnish fresh milk for a family which could not afford to keep a cow, and in many cases live on land and forage that would otherwise be wasted. The lives of many infants might be saved if a fresh supply of goats' milk were available. Although the American people are awakening to an appreciation of milk goats, the greatest

difficulty at the present time is in meeting the demand for good animals. It should be borne in mind also that goats' meat is nearly equal to mutton.

The production of goats' milk and the raising of goats for production and breeding purposes fits in well with the home-project plan. Many boys and girls living in towns or near the larger cities can keep a goat who could not keep a pig. Goats, if properly treated, make excellent pets, and inasmuch as they are not raised primarily to be killed for meat production no difficulties arise when the boys and girls develop them as pets. Although the caring for one goat for family milk production should be accepted as a suitable minor project in animal husbandry, the students should be encouraged to develop the work in a commercial way as far as their resources will permit. The production of milk for the feeding of infants and invalids will furnish an excellent ideal toward which to work, as it offers opportunity not only for the application of science and the development of good business training but also an opportunity for a much needed public service. Students who are desirous of working into the dairy business will be able to secure training in the care and handling of milk and in developing a trade which they may apply later to a dairy where cows' milk is handled. The experience gained in feeding and in breeding goats will also prove of value in handling cows and other animals.

GETTING A START.

As milk goats are abundant in very few sections, the student must take what he can get. Pure-bred animals may not be procurable in the district or their price may be beyond the reach of the student in getting a start. As a rule, it will not be worth while to make an effort toward milk production unless there is a male of good breeding available for service in the district. If the services of a buck of a good milking strain are available, a start may be made with a common doe with a tendency toward good milk production or with grade kids. Public-spirited bankers and others have given financial aid in getting pigs of good breeding for the boys' and girls' projects. Perhaps some of these men or doctors who are interested in securing better milk for babies and invalids may aid in getting pure bred milk goats into the community. If the teacher of agriculture will make known the possibilities in milk goats of good breeding, an effective appeal may be made to both citizens and students to use them for what they are worth in helping to meet the present food situation and in developing economical production for the future.

GOAT PROJECT STUDY OUTLINE.

I. Shall I go into milk goats as a project?
   1. What possibilities are there for raising goats in this section?
   2. Is there a special demand for goats' milk?
   3. Is it not possible to develop a market for goats' milk for feeding invalids and infants?
   4. Will I be able to secure suitable stock with which to start?
   5. What are the prospects for securing and using vacant lots or waste land suitable for pastures?
   6. Will there be any opportunity to work into the raising of pure-bred goats for breeding purposes?
   7. What possibilities are there for renting goats?

II. What type and breed of goats shall I select?
   1. Why should an effort be made to secure goats bred especially for milk production?
   2. What breeds of milk goats have been established in the United States?
   3. What are the distinguishing characteristics of the Swiss goats which have been brought to this country?
   4. What characteristics of the Nubian breed justifies its consideration?
   5. Is it possible to find individuals among common does in which milk production is developed?
   6. Will it be possible for me to obtain pure-bred does as a basis for a breeding herd?
   7. How may I go about to develop a good herd from common does?
   8. Do I know the characteristics of both does and bucks of the milk type?

9. Are there pure-bred bucks of good type in the district available for community service?
10. How do prices range for pure-bred bucks, does, and kids? For common goats and grades?
11. Where may I get definite information concerning pure-bred goats and their breeders?

III. Can I manage goats properly in breeding?
1. When is the best time to select does for breeding?
2. What points should be considered especially in does for breeding?
3. At what age are does at their best for breeding?
4. At what time should the does freshen?
5. When should the does be bred to secure kids in the fall and in the spring?
6. Is it always possible to have does kid in the fall?
7. How many kids may be expected at a time?
8. What special care should be given a breeding buck?

IV. Do I understand proper feeding and general management of mature goats?
1. What is a good ration for bucks when off pasture?
2. Under what conditions may goats be used on brush land? In orchards?
3. What relation is there to the feeding of goats for milk production to the feeding of cows for the same purpose?
4. Why is roughage and some succulent feed essential? What feeds are desirable for this purpose?
5. What grain feeds will be most economical in this section? How much grain should be fed during the winter season? When on pasture?
6. Why must the individuality of the goats be considered in feeding?
7. What provisions should be made for exercise?
8. What precautions should be taken in order to have food clean and wholesome?
9. What provisions are made for salting?
10. What provisions must be made for fresh water?

V. Do I understand the proper care and feeding of kids?
1. Why is it most satisfactory to allow the kids suckle their dams?
2. What advantage is there in rearing kids dropped in the spring as compared with those born in the fall?
3. How much milk do the kids require?
4. How may the kids be fed successfully on cows' milk?
5. Why should they have the milk first given by the mother?
6. What is the best age for removing kids from the mother?
7. At what age may the kids be weaned?
8. Why are alfalfa and clover hays to be recommended?
9. What is a good grain ration for the kids?
10. What provisions should be made for their exercise?
11. When and how should the male kids be castrated?
12. For what purposes are the castrated male kids used?
13. How are the kids marked for identification?
14. How may goats be treated for lice?
15. How are matured goats dehorned? How may the horns be prevented from developing on the kids?
16. What is the best method of trimming the hoofs?
17. What kind of a fence is best for goat inclosures?

VI. Do I understand the more common troubles of goats?
1. How do goats compare with other farm animals in regard to health?
2. What are the symptoms of stomach worms?
3. How may these parasites be prevented?
4. How is the gasoline treatment given? The copper sulphate treatment?
5. What are the symptoms of takosis and Malta fever, and where can I secure definite information concerning these diseases should they occur?
6. What is the difference between ordinary abortion and contagious abortion? How should abortion be treated?

7. What is a satisfactory method of treating constipation?
8. How are caked udder and sore teats handled?
9. What are the causes and the method of treatment of foot rot?

VII. Can I handle the milk properly and turn out a first-class product?

1. What is considered a good lactation period for goats?
2. What factors influence the length of the lactation period?
3. What equipment should be provided for the milking of goats?
4. What precautions should be taken to be sure of securing clean milk?
5. Why should not goats be milked in the same room where they are kept?
6. What are the advantages claimed for each system of milking?
7. How soon may the milk be used after kidding?
8. Why are regularity and kindness so essential to the handling and milking of goats?
9. Why should the milk be weighed and accurate records kept?
10. What is the best method of straining the milk?
11. Why should the milk be cooled immediately? How is the cooling accomplished?
12. How are the milk utensils handled to assure cleanliness?

VIII. What other products may be obtained from a herd of goats?

1. What is the nature and value of butter from goats' milk?
2. How is cheese made from goats' milk?
3. How does the goat compare with the sheep as a meat-producing animal?
4. How does the goat meat compare with mutton in quality?
5. Of what use are skins and what is their value?

CLASSROOM INSTRUCTION.

Based on project outline.—In connection with a study of sheep husbandry in some sections some time may be given with profit to a consideration of milk goats if one or more students have selected the keeping of goats as a home project. Perhaps the consideration given the subject will arouse interest and show the possibilities in such a project. Such a project furnishes a good basis for consideration in the classroom, as it supplies a guide as to the practice and that which will apply to local conditions.

Use of reference material.—Students who have goat projects should be encouraged to secure one of the special journals devoted to goats and other publications. The lessons given to the class as a whole may be based upon Farmers' Bulletin 920, Milk Goats. In case there is little time for the whole class to consider the subject this bulletin may be assigned to a student who is interested to make a special report to the class.

Suggestions regarding the treatment of topics with regard to both classroom instruction and home projects follow.

A study of types and breeds.—Much can be done to arouse interest in goats by making the students acquainted with something better than the common goats they have known. If there are any herds of pure-bred goats in the community, they should be utilized as far as possible in connection with a study of types and breeds. Good illustrations will be helpful in showing ideals and to serve in the absence of the living animals. In connection with a study of the milk type it will prove helpful to have the students make up a score card as a class problem. Cards for sheep and for the dairy cow will be suggestive of form and arrangement. Practice in the use of the score card and in comparative judging should be given wherever there is time and material is available.

Management of breeding animals.—Goats kept as pets or in connection with a production project furnish an excellent basis for learning the general principles of breeding. If a student has to pay twice as much for goat No. 1 as for goat No. 2 because the first goat represents better breeding, the law of heredity will appeal to him in a new light. Again, if he is to retain one of two kids for milk production or for breeding purposes, the principle of selection will mean more than a mere abstract statement. Emphasis should be placed upon such practical points as the proper age for breeding, the periods of heat, the gestation period, and the care of the doe at time of kidding.

Feeding and management.—In connection with this topic also there is an application of general principles to a particular practice. Inasmuch as the gen-

eral principles of animal feeding have been worked out previously, the time may be taken in a consideration of the particular problems of feeding goats. The feeds and feeding practice discussed in connection with sheep husbandry will form a good basis for comparison for general feeding and the feeding of dairy cows a basis for the feeding of does for milk production. In connection with general management special attention should be given the matter of cleanliness and sanitation, as the students will likely keep goats around the home. Inasmuch as they are very apt to start with kids and the care of the young kids is rather critical, emphasis should be placed upon the details of their care and management. If goats are kept near the school for commercial purposes, a visit to the farm should prove profitable. The students should make definite inquiry and take notes upon all phases of practice in feeding and management. Inasmuch as many of the common goat troubles are similar to those of sheep, the consideration of goat diseases may come very well in connection with a discussion of the diseases of sheep.

Care and handling of milk.—As the principles and practice connected with the care and handling of goats' milk do not differ from those concerned with the production of clean cows' milk, this phase of the work may be considered a part of the work in dairying. If dairy husbandry does not come in the same year, it will be necessary to review briefly the principles involved in handling milk in the application to the care of goats' milk.

One of the problems in giving practical instruction in dairying in the ordinary high school is to secure a regular supply of milk for a small dairy or laboratory so essential to practical training. It is impractical for most of these schools to keep cows or to operate a dairy sufficiently large to take the milk of regular patrons in a commercial way. Keeping one or more milk goats at the school would not only insure a regular supply of milk for dairy work, but would also give a concrete basis for other work in animal husbandry such as feeding and breeding.

SCHOOL AND HOME PRACTICUMS.

If there are a sufficient number of students interested and material near the school for practice, the laboratory time of the entire class may be taken in such practical work with goats as suggested for sheep. Such work may include (*a*) a use of the score card, (*b*) comparative judging, (*c*) removal of horns, and (*d*) shearing and trimming (where Angora goats are involved). As suggested in the previous paragraph, the practical work may also include such exercises in dairying as: (*a*) Use of the Babcock test, (*b*) use of the sediment test, and (*c*) making butter and cheese. If there is neither sufficient time nor interest general enough to take the time of the whole class for such work, assignments for individual home practicums should be made to students having an interest and facilities for doing the work and credit given for such work when well done as a part of the course.

THE ANGORA GOAT.

In nearly all sections of the United States there are sections adapted to the Angora goat and the production of mohair. The raising of these goats will also make excellent home projects for students living on farms adapted to this industry. The directions given for classroom instruction, home projects and practicums in connection with milk goats and sheep may be adapted to the Angora. Plans and outlines for both lessons and projects may be made up with the material in Farmers' Bulletin 573, The Angora Goat, as a basis for subject matter.

REFERENCES.

The following Farmers' Bulletins of the United States Department of Agriculture (available for free distribution by the department):

573. The Angora Goat.
576. Breeds of Sheep for the Farm.
713. Sheep Scab.
810. Equipment for Farm Sheep Raising.
840. Farm Sheep Raising for Beginners.
920. Milk Goats.
935. The Sheep-Killing Dog.

The following Department Bulletins of the United States Department of Agriculture (for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C.):

20. The Management of Sheep on the Farm. Price, 10 cents.
94. Domestic Breeds of Sheep in America. Price, 25 cents.
206. The Wool Grower and the Wool Trade. Price, 15 cents.
593. Judging Sheep as a Subject of Instruction in Secondary Schools. Price, 10 cents.

The following documents, prepared in the division of Agricultural Instruction, as suggestions to teachers in secondary schools, have been issued previously:

A. I. 1. Farm Records and Accounts.
A. I. 2. Agricultural Exhibits and Contests.
A. I. 3. Food Requirements of the Human Body.
A. I. 4. Raising Ducks, Geese, and Turkeys.
A. I. 5. Types and Breeds of Farm Animals.
A. I. 6. Home Floriculture and Home Ground Improvement.
A. I. 7. The Propagation and Pruning of Plants.
A. I. 8. Marketing Farm Products.
A. I. 9. Increasing Production on the Farm.

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